

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

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1. (PREVIOUSLY AMENDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix,

said display device driving circuit comprising:

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a transition instruction signal that causes the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the transition instruction signal, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until next successive output is started by an instruction signal for successively outputting the display scanning signals.

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2. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals with respect to the respective scanning signal lines.

3. (ORIGINAL) The display device driving circuit as set forth in claim 1, comprising deactivating means for deactivating an operation of the scanning signal line driving section based on a synchronize signal and the transition instruction signal for displaying the image.

4. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said control means includes an unscanned area recognizing section for recognizing an unscanned area based on the transition instruction signal, and controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted only to those scanning signal lines which correspond to the unscanned area as recognized by the unscanned area recognizing section.

5. (ORIGINAL) The display device driving circuit as set forth in claim 2, wherein said scanning signal line driving section has a plurality of scanning starting positions which are set in a vertical direction, and successively outputs, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to a non-image area, which is an area from a scanning starting position therein in the vicinity of a front portion of an image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputs the display scanning signals to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

6. (ORIGINAL) The display device driving circuit as set forth in claim 5, wherein said scanning signal line driving section deactivates an operation of a display device, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area and until next successive output is carried out.

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7. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within one horizontal period to scanning signal lines of a non-image area.

8. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within two horizontal periods to scanning signal lines of a non-image area.

9. (PREVIOUSLY AMENDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix,

said display device driving circuit comprising:

input means for receiving a transition instruction signal for causing a transition from successive output to simultaneous output with respect to the output of the display scanning signals to the respective scanning signal lines; and

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a transition instruction signal that causes the transition from successive output to simultaneous output, and controlling the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until next successive output is started by an instruction signal for successively outputting the display scanning signals.

10. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals with respect to the respective scanning signal lines.

11. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means includes deactivating means for deactivating an operation of the scanning signal line driving section based on a synchronize signal and the transition instruction signal for displaying the image.

12. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means includes an unscanned area recognizing section for recognizing an unscanned area based on the transition instruction signal, and controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted only to those scanning signal lines which correspond to the unscanned area as recognized by the unscanned area recognizing section.

13. (ORIGINAL) The display device driving circuit as set forth in claim 10, wherein said scanning signal line driving section has a plurality of scanning starting positions which are set in a vertical direction, and successively outputs, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to a non-image area, which is an area from a scanning starting position therein in the vicinity of a front portion of an image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputs the display scanning signals to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

14. (ORIGINAL) The display device driving circuit as set forth in claim 13, wherein said scanning signal line driving section deactivates an operation of a display device, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area and until next successive output is carried out.

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15. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within one horizontal period to scanning signal lines of a non-image area.

16. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within two horizontal periods to scanning signal lines of a non-image area.

17. (PREVIOUSLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, and has a partial display function for a non-image area and an image display area, said driving method comprising the step of:

simultaneously outputting the display scanning signals with respect to the plurality of scanning signal lines based on a transition instruction signal that causes a transition from successive output to simultaneous output, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until next successive output is started by an instruction signal for successively outputting the display scanning signals.

18. (ORIGINAL) The method as set forth in claim 17, wherein an operation of a display device is deactivated, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area based on the transition instruction signal and until next successive output is carried out.

19. (ORIGINAL) The method as set forth in claim 17, wherein, among a plurality of scanning starting positions which are set in a vertical direction, the display scanning signals are successively outputted to scanning signal lines which correspond to a non-image area, which is an area from a scanning starting position therein in the vicinity of a front portion of an image display area to the image display area, and to scanning signal lines which correspond to the image

display area, and thereafter the display scanning signals are simultaneously outputted to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

20. (ORIGINAL) The method as set forth in claim 17, wherein the display scanning signals are simultaneously outputted based on the transition instruction signal to each of a first line group and a second line group of the scanning signal lines which correspond to an unscanned area.

21. (ORIGINAL) The method as set forth in claim 17, wherein frequencies of the display scanning signals are different between successive output and simultaneous output of the display scanning signals with respect to the scanning signal lines.

22. (ORIGINAL) The method as set forth in claim 17, wherein display scanning signals according to the non-image area are simultaneously outputted within one horizontal period with respect to scanning signal lines which correspond to the non-image area.

23. (ORIGINAL) The method as set forth in claim 17, wherein display scanning signals according to the non-image area are simultaneously outputted within two horizontal periods with respect to scanning signal lines which correspond to the non-image area.

24. (PREVIOUSLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, and has a partial display function for a non-image area and an image display area,

said method comprising the steps of:

distinguishing a predetermined display portion and a predetermined non-display portion from each other;

simultaneously outputting the display scanning signals and the display data signals according to the non-image area with respect to the respective scanning signal lines and the respective data signal lines which correspond to the non-image area; and

deactivating operation of the scanning signal line driving section until next display is carried out.

25. (ORIGINAL) The method as set forth in claim 24, wherein display scanning signals according to the non-image area are simultaneously outputted within one horizontal period with respect to scanning signal lines which correspond to the non-image area.

26. (ORIGINAL) The method as set forth in claim 24, wherein display scanning signals according to the non-image area are simultaneously outputted within two horizontal periods with respect to scanning signal lines which correspond to the non-image area.

27. (PREVIOUSLY AMENDED) An image display device which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines, a data signal line driving section for outputting display data signals respectively to data signal lines, so as to display an image according to the display data with respect to pixels which are disposed in a matrix, said pixels having a partial display function for an image display area and a non-image area,

said image display device comprising:

Cont scanning signal line control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a transition instruction signal that causes the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the transition instruction signal, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until next successive output is started by an instruction signal for successively outputting the display scanning signals.

28. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals to the respective scanning signal lines and includes a plurality of scanning starting positions which are set in a vertical direction, said

scanning signal line driving section successively outputting, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to a non-image area, which is an area from a scanning starting position therein in the vicinity of a front portion of an image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputting, based on the transition instruction signal, the display scanning signals to scanning signal lines which correspond to an unscanned area.

29. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that an operation of the image display device is deactivated after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area based on the transition instruction signal and until next successive output is carried out.

30. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the transition instruction signal so that the display scanning signals are simultaneously outputted to each of a first line group and a second line group which correspond to an unscanned area.

31. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within one horizontal period with respect to scanning signal lines of the non-image area.

32. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within two horizontal periods with respect to scanning signal lines of the non-image area.

33. (CURRENTLY AMENDED) An image display device which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines, a data signal line driving section for outputting display data signals respectively to data signal lines, and a set section for setting an image display area according to the display data and a non-display area with respect to pixels, so as to display an image according to the display data with respect to the pixels which are disposed in a matrix,

said image display device comprising:

scanning signal line control means for controlling the scanning signal line driving section so that the display scanning signals are simultaneously outputted with respect to the respective scanning signal lines which correspond to the non-image area as set by the set section,

the scanning signal line driving section including a plurality of serially connected shift register sections for outputting the display scanning signals respectively to the scanning signal lines, and

the scanning signal line control means individually and simultaneously scanning the shift register sections in the non-image area, and

wherein to the serially connected shift registers, respective start pulse signals are supplied and being signaled by the start pulse signals, scanning of the scanning signal lines is started.

34. (ORIGINAL) The image display device as set forth in claim 33, comprising data signal line control means for controlling the data signal line driving section so as to output the display data signals for the non-image area to the respective data signal lines when the display scanning signals are simultaneously outputted.

35. (ORIGINAL) The image display device as set forth in claim 33, comprising first deactivating means for deactivating an operation of the data signal line driving section after the simultaneous output and until next successive output with respect to a horizontal period based on the display data.

36. (ORIGINAL) The image display device as set forth in claim 33, comprising second deactivating means for deactivating an operation of the scanning signal line driving section after

the simultaneous output and until next successive output with respect to a horizontal period based on the display data.

37. (ORIGINAL) The image display device as set forth in claim 33, wherein a first clock signal for displaying the image display area and a second clock signal for displaying the non-image area are different from each other.

38. (ORIGINAL) The image display device as set forth in claim 33, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within one horizontal period with respect to the scanning signal lines of the non-image area.

39. (ORIGINAL) The image display device as set forth in claim 33, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within two horizontal periods with respect to the scanning signal lines of the non-image area.

40. (PREVIOUSLY ADDED) The method as set forth in claim 17, wherein the display scanning signals are outputted based on the transition instruction signal simultaneously to an odd-numbered line group of the scanning signal lines that correspond to an unscanned area and simultaneously to an even-numbered line group of the scanning signal lines that correspond to the unscanned area.

41. (PREVIOUSLY ADDED) The method as set forth in claim 17, wherein the display scanning signals are outputted based on the transition instruction signal simultaneously to odd-numbered pairs of adjacent ones of the scanning signal lines that correspond to an unscanned area and simultaneously to even-numbered pairs of adjacent ones of the scanning signal lines that correspond to the unscanned area.

42. (PREVIOUSLY ADDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix, said display device driving circuit comprising:

deactivating means for deactivating operation of the scanning signal line driving section based on a synchronize signal for image display and based on a transition instruction signal; and

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a transition instruction signal for causing the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the transition instruction signal, so that the display scanning signals are outputted simultaneously within one horizontal period or two horizontal periods with respect to all scanning signal lines until next scanning is started.

43. (CURRENTLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, the display device having a partial display function for a non-image area and an image display area, horizontal signal lines in a vertical period of the display device being greater in number than the scanning signal lines, said method comprising the step of:

Cancel. simultaneously outputting the display scanning signals and the display data signals according to the non-image area with respect to the respective scanning signal lines and the respective data signal lines that correspond to the non-image area; and

wherein the number of horizontal signal lines in a vertical period shall be understood to correspond to the number of scanning signal lines of input video signals.
